	Application No.	Applicant(s)
Notice of Allowability	10/692,245	ROTITHOR ET AL.
	Examiner	Art Unit
	Paul W. Schlie	2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *an examiner initiated interview and resulting amended claims dated 6/7/06.*.

2. ☒ The allowed claim(s) is/are *1,2,4-6,8-31,33-35,37-42,44,45,47 and 48*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
      Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

2.   Authorization for this examiner's amendment was given in a telephone interview

with Sharon Wong on 6/7/06, whereby:

   Claims 1, 30, 37 and 47 are further amended; and

   Claims 3, 7, 32, 36, 43, and 46 and 49-70 are canceled; and

   Claims 2, 4-6, 8-29, 31, 33-35, 38-42, 44-45 and 48 remain as originally

presented or most recently otherwise amended.

3.   The application has been amended as follows:

   1. (Currently Amended)   A method for out of order read or write scheduling
   using at least one queue, comprising:
          sorting memory transactions into at least one queue;
          within at least one queue, sorting memory transactions by attributes
   including address and address mapping used by memory, processor priority and
   demand versus prefetch transaction type;
          scheduling memory transactions out of order in accordance with
   scheduling algorithms, wherein if a DRAM command of a later memory
   transaction is scheduled before the last DRAM command of an earlier memory
   transaction, the later memory transaction is considered scheduled out of order
   and wherein the entire at least one queue is considered while making scheduling
   decisions;
          accommodating page closing policy with no prior assumption being made
   about pages being in a particular page miss or page empty or page hit state; and

making out of order selection at the time of DRAM command launch.

3.   (Cancelled)

7.   (Canceled)

30.   (Currently Amended) A machine readable medium having stored therein a plurality of machine readable instructions executable by a processor for out of order memory scheduling using at least one queue, comprising:

instructions to sort memory transactions into at least one queue including address and address mapping used by memory, processor priority and demand versus prefetch transaction type;

instructions to, within at least one queue, sorting memory transactions by attributes;

instructions to schedule memory transactions out of order in accordance with scheduling algorithms, wherein if a DRAM command of a later transaction is scheduled before the last DRAM command of an earlier transaction, the later transaction is considered scheduled out of order and wherein the entire at least one queue is considered while making scheduling decisions;

instructions to accommodate page closing policy with no prior assumption being made about pages being in a particular page miss or page empty or page hit state; and

instructions to make out of order selection at the time of DRAM command launch.

32.   (Canceled)

36.   (Canceled)

37.   (Currently Amended)   An apparatus comprising:

at least one queue associated with a memory bank for receiving memory

transactions sorted by attributes <u>including address and address mapping used by</u>

<u>memory, processor priority and demand versus prefetch transaction type</u>;

a page table to store information related to memory transactions; and

a comparator and selector for receiving unblocked memory transactions

from at least one queue and receiving page table information to determined if the

unblocked transaction is a page hit, page miss or page empty,

wherein memory transactions are scheduled out of order in accordance

with scheduling algorithms, the entire at least one queue is considered while

making scheduling decisions, <u>page closing policy accommodations are made</u>

<u>with no prior assumption about pages being in a particular page miss or page</u>

<u>empty or page hit state</u> and out of order selections are made at the time of

DRAM command launch.

43.   (Canceled)

46.   (Canceled)

47.   (Currently Amended) A system comprising:

a memory including a plurality of banks; and

a memory controller operatively in communication with the memory;

at least one queue associated with a memory bank for receiving memory

transactions sorted by attributes <u>including address and address mapping used by</u>

<u>memory, processor priority and demand versus prefetch transaction type</u>;

a page table to store information related to memory transactions; and

a comparator and selector for receiving unblocked memory transactions

from at least one queue and receiving page table information to determined if the

unblocked transaction is a page hit, page miss or page empty,

wherein memory transactions are scheduled out of order in accordance

with scheduling algorithms, the entire at least one queue is considered while

making scheduling decisions, <u>page closing policy accommodations are made</u> <u>with no prior assumption about pages being in a particular page miss or page</u> <u>empty or page hit state</u> and out of order selections are made at the time of DRAM command launch.

49-70. (Canceled)

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul W. Schlie whose telephone number is 571-272-6765. The examiner can normally be reached on Mon-Thu 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 517-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PIERRE BATAILLE
PRIMARY EXAMINER

6\10\06